Devices for Storing a Blanket to be Supplied to the Cylinder of a Printing Machine

The invention relates to devices for storing a dressing to be supplied to a printing press, and a method for supplying dressings to a cylinder of a printing press, in accordance with the preambles of claim 1 or 5.

A magazine for automatic printing plate change is known from DE 43 42 359 C1, into which a cassette can be inserted, which can take in several printing plates which can be removed by means of a plate removal arrangement, wherein pivotable guide rails are provided laterally in respect to the cassette, wherein the guide rails separate printing plates which have been stored next to each other in the immediate vicinity of the plate removal arrangement in a fan shape, by means of which the single removal of the printing plates from the cassette performed by means of the plate removal arrangement is made easier, wherein a suction device of the plate removal device always grasps that printing plate of the printing plates placed into a fan shape by the guide rails which lies on top, and pulls it out of the magazine. In connection with this device it is disadvantageous that printing plates stored in the magazine are only removed from the magazine by pulling them out. In the course of pulling the printing plates out of the magazine the danger arises that the printing plates become scratched by rubbing against dirt particles and other objects, or are damaged in some other way. Moreover, a storage position of a printing plate stored in the magazine cannot be changed mechanically inside the magazine. For a change of the storage

position of a printing plate stored in the magazine it is always necessary to first take the printing plate out of the magazine.

A method and a device for the automatic feeding of a printing plate to a plate cylinder, or the removal from a plate cylinder of a rotary printing press, are known from DE 39 40 795 A1. The method for the automatic feeding of a printing plate to a plate cylinder of a rotary printing press, wherein inter alia the plate cylinder has means for clamping and bracing the printing plate, provides that the printing plate is placed into a storage chamber of a printing plate supply and removal device, that the plate cylinder is rotated into a plate feeding position, and the printing plate is fed to a clamping device of the plate cylinder by means of a number of transport rollers. The method for the automatic removal of a printing plate from a plate cylinder of a rotary printing press, wherein the plate cylinder inter alia has means for unclamping and releasing the printing plate, is distinguished in that the plate cylinder is rotated forward into a printing plate release position, that a clamping flap is opened for grasping a printing plate end, that the plate cylinder is rotated backward and that the printing plate is conveyed by means of a number of transport rollers to a storage chamber of a printing plate supply or removal device. The device for executing the method has at least one transport roller designed as a drive roller and one transport roller designed as a contact pressure roller, wherein the contact pressure roller can be placed against the drive roller. In addition, various actuating means, a pivotably seated contact pressure roller for pressing the printing plate against the plate cylinder, as well as ejection fingers, can be provided, wherein the ejection fingers can have tips which are arranged so that they can swivel into the periphery of the plate

cylinder. The storage chamber of the printing plate supply and removal device can also be seated so that it is pivotable around a joint.

DE 39 40 796 A1 describes an arrangement for automatically changing a printing plate on a plate cylinder of a rotary printing press, wherein the plate cylinder inter alia has means for clamping and bracing a printing plate, wherein the printing plate changing device has two storage chambers, so that a printing plate released from the plate cylinder can be conducted into one of the storage chamber by means of transport rollers, while a printing plate stored in the other storage chamber can be conducted to a clamping device of the plate cylinder by means of transport rollers.

EP 1 084 839 A1 describes a device for holding and conveying a printing forme. In this case the device has translatory conveying arrangements, which convey a printing forme to be mounted on a forme cylinder, or a printing forme to be removed from the plate cylinder. While, for changing a printing forme, the device is tilted around an axis of rotation from a position of rest into its operating position, a hook is pivoted, merely by means of its inherent weight, into the space where the printing forme is stored and protects the printing forme at its trailing beveled end from unintentionally falling out of this space.

A device for the automatic feeding of a printing plate to a forme cylinder of a printing press, or for removing a printing plate from a forme cylinder, is known from EP 0 214 549 B1, wherein the printing plate to be fed to the forme cylinder is fed to the forme cylinder while remaining in a desired position by means of lateral positioning elements, wherein the feeding of the

printing plate takes place from a substantially horizontal storage position.

A device for automatically exchanging printing plates is known from EP 0 100 779 A1, wherein several plates to be mounted are suspended in a plate storage device on a clamping rod arranged below the plate cylinder and are lifted to the plate cylinder on the clamping rod.

A device for automatically changing printing plates is known from WO 03/04863 A1, wherein several printing formes are stored in a magazine, and wherein a changing of a printing forme with a forme cylinder takes place only when the magazine is brought into a slanted position.

A device for the automatic feeding of printing formes to a forme cylinder is known from USP 4,178,848, wherein printing formes without beveled ends are stored in a stack inclined in the feeding direction, and are sequentially fed, driven by rollers, to the forme cylinder via a conveyor belt arranged in front of the stack, wherein the respectively lowest printing forme is pulled from the stack at its front end by a suction device. This device, which is very long, is not suitable for printing formes with beveled ends. Furthermore, when pulling out the printing formes which are stacked directly on top of each other, there is the danger of damaging their sides with the print image.

The object of the invention is based on creating a device for storing a dressing to be supplied to a cylinder of a printing press, and a method for feeding dressings to a cylinder of a printing press.

This object is attained in accordance with the invention by means of the characteristics of claims 1 or 66.

The advantage which can be realized by means of the invention consists in particular in that it is possible to change several dressings on a cylinder of a printing press rapidly and dependably at the same time, or at least in very rapid succession. By means of the actuation of a holding element, the dressing falls from a vertically upper storage position into a storage position located thereunder, from which it can be transported to the cylinder. By means of actuating the holding element, the stored dressing changes in free fall from its vertically upper storage position into the storage position located underneath. The actuation of the holding element preferably takes place by means of a controlled drive mechanism and can therefore be mechanically performed. In the course of changing the storage position of a dressing stored in the magazine, the dressing whose storage position is to be changed remains in the magazine during the changing operation, wherein the change can be triggered by a controllable machine element of the magazine.

A dressing whose storage position is to be changed is not exposed to the danger of its surface being damaged during the change. The device is also suitable for dressings which are in particular flexionally elastic in length and have suspension legs which are beveled at their ends. Moreover, the structural height of the device is extremely low, so that it does not hamper the required access to the printing unit.

Exemplary embodiments of the invention are represented in the drawings and will be described in greater detail in what follows.

Shown are in:

Fig. 1, a perspective representation of a dressing,

Fig. 2, a simplified sectional representation of a holding device for a dressing arranged on a cylinder,

Fig. 3, dressings which have been brought tangentially to a cylinder, on which a radial force acts during their mounting,

Fig. 4, elastically pre-tensioned dressings in the course of being mounted on a cylinder,

Fig. 5, a four-cylinder printing press with a printing forme magazine,

Fig. 6, a device for changing a dressing on a forme cylinder of a printing press,

Fig. 7, a detailed view of guide rails for the lateral holding of a second printing forme in a chute,

Fig. 8, printing formes arranged next to each other in the axial direction of the forme cylinder in a chute,

Fig. 9, a suspension of a guide rail which can be moved in a chute,

Figs. 10 to 12, further exemplary embodiments of the embodiment of the lower chute,

Figs. 13 to 35, representations of a process sequence for changing printing formes on a forme cylinder,

Fig. 36, a further exemplary embodiment of a printing press with printing forme magazines.

A dressing 01 (Fig. 1), which for example is designed as a plate-shaped printing forme 01, or as a support plate for a printing blanket, has a substantially rectangular area of a length L and a width B, wherein the length L can have measured values between 400 mm and 1300 mm, for example, and the width B measured values between 280 mm and 1500 mm, for example. Preferred measured values for the length L lie, for example, between 360 mm and 600 mm, and for the width B between 250 mm and 430 mm, for

example. The area has a bearing area, which will be called bearing area 02 in what follows, on which the dressing 01 rests when it is arranged on the surface 07 of a cylinder 06 (Fig. 2). The reverse side of the bearing area 02 is a working area which, in case the dressing 01 is designed as a printing forme 01, is provided with a print image, or at least can be provided with a print image. The dressing 01 has two oppositely located ends 03, 04, each preferably with beveled suspension legs 13, 14, wherein the ends 03, 04 delimit the bearing area 02, and wherein each of the suspension legs 13, 14 preferably extends wholly, or at least partially, over the width B of the dressing 01. The bearing area 02 of the dressing 01 is flexible at least over the length L and, when the dressing 01 is arranged on the surface 07 of the cylinder 06, can be matched to the curvature of the latter (Fig. 2). When the printing forme 01 is arranged on the surface 07, the length L of the bearing area 2 then extends in the direction of the circumference of the cylinder 06, while the width B of the bearing area 02 extends in the axial direction of the cylinder 06.

As represented in Fig. 2, the suspension legs 13, 14 of the dressing 01 are fastened by means of a holding device, wherein the holding device is arranged in a groove 08, and wherein the groove 08 as a rule extends in the axial direction in respect to the cylinder 06. An end 03 of the dressing 01 which is aligned with the production direction P of the cylinder 06, is called its leading end 03, while the oppositely located end 04 is the trailing end 04 of the dressing 01. At least the ends 03, 04 of the dressing 01, along with the suspension legs 13, 14 formed thereon, are made of a rigid, for example metallic material, for example of an aluminum alloy. Customarily the material thickness D of the dressing 01 (Fig. 1), or the material thickness D of at

least the suspension legs 13, 14, amounts to a few tenths of a millimeter, for example 0.2 mm to 0.4 mm, preferably 0.3 mm. Thus, the dressing 01 as a whole, or at least its ends 03, 04, consists of a dimensionally stable material, so that the ends 03, 04 can be permanently deformed by bending against a material-specific resistance.

A beveled suspension leg 13, 14 is formed at least on each end 03, 04 of the dressing (Fig. 1), but preferably at both ends 03, 04, along a bending edge 11, 12, wherein the suspension legs 13, 14 can be introduced into a narrow, in particular slit-shaped opening 09 of the groove 08 of the cylinder 06 (Fig. 2), and can be fastened there by means of a holding device, for example a clamping device. For example, in relation to the length L of the non-curved level bearing area 02 of the not yet mounted dressing 01, a suspension leg 13 is beveled on its end 03 at the bending edge 11 at an opening angle $\alpha 1$ or, on its end 04 a suspension leg 14 is beveled at the bending edge 12 at an opening angle ß1 (Fig. 1), wherein the opening angles $\alpha 1$, ß1 as a rule lie between 30° and 140°. If the opening angle $\alpha 1$ is assigned to the leading end 03 of the dressing 01, it is preferably embodied as an acute angle and in particular is 45°. The opening angle ß1 at the trailing end 04 of the dressing 01 is often embodied to be larger than 80°, or as an obtuse angle, and in particular it is 85° or 135°. The beveled suspension leg 13 at the leading end 03 has a length l13 which, for example, lies in the range between 4 mm and 30 mm, in particular between 4 mm and 15 mm. The beveled suspension leg 14 at the trailing end 04 has a length l14 which is 4 mm to 30 mm, for example, in particular between 8 mm and 12 mm, wherein the shorter length is more likely preferred in order to assure the

easiest possible removal of the suspension legs 13, 14 from the opening 09 of the groove 08.

Fig. 2 shows in a simplified sectional view a cylinder 06 with a surface 07 and a groove 08, which has a narrow, slit-like opening 09 toward the surface 07 of a slit width S, wherein the slit width S is less than 5 mm and preferably lies in the range between 1 mm to 3 mm. In the production direction P of the cylinder 06, the opening 09 has a front edge 16 and a rear edge 17. An acute opening angle $\alpha 2$, which lies between 30° and 50°, preferably is 45°, is formed between the wall 18 extending from the front edge 16 in the direction of the groove 08, and an imagined tangent line T09, which rests on the opening 09 in the surface 07 of the cylinder 06. Therefore the beveled suspension leg 13 at the leading end 03 of the dressing 01 can be preferably suspended with a positive connection at this front edge 16 of the opening 09, because the opening angle $\alpha 1$ at the leading end 03 of the dressing 01 is preferably matched to the opening angle $\alpha 2$. The situation is the same at the trailing end 04 of the dressing 01. An opening angle ß2, which either lies between 80° and 95°, is preferably 90°, or lies between 120° and 150°, preferably is 135°, is formed between the wall 19 extending from the rear edge 17 in the direction of the groove 08 and an imagined tangent line T09, which rests on the opening 09 in the surface 07 of the cylinder 06. Therefore the beveled suspension leg 14 at the trailing end 04 of the dressing 01 can be preferably suspended with a positive connection at this rear edge 17 of the opening 09, because the opening angle ß1 at the trailing end 04 of the dressing 01 is preferably matched to the opening angle ß2.

At least one preferably pivotably seated holding means 21, and a preferably pre-tensioned spring element 22, for example, are

arranged in the groove 08, wherein the spring element 22 presses the holding element 21 against the beveled suspension leg 14 at the trailing end 04, for example, which is suspended from the rear edge 17 of the opening 09, because of which the suspension leg 14 is maintained at the trailing end 04 against the wall 19 extending from the rear edge 17 in the direction of the groove 08. For releasing the pressure force exerted by the holding means 21, an actuating means 23, preferably a pneumatically actuable means 23, is provided in the groove 08, which, when actuated, pivots the holding means 21 against the force of the spring element 22. The holding device described by way of example therefore consists substantially of the holding means 21, the spring element 22 and the actuating means 23.

The cylinder 06 described by way of example is preferably embodied in such a way that several, preferably identical dressings 01 can be arranged on its surface 07. If the cylinder 06 is designed as a forme cylinder, it can be covered, for example, with six plate-shaped printing formes 01, arranged side-by-side in its axial direction. It has also preferably been provided that more than one dressing 01 can be arranged on the cylinder 06 in the direction of its circumference. It is therefore possible to provide, for example, two grooves 08 extending axially in respect to the cylinder 06 under its surface 07, which have openings 09 extending axially in respect to the cylinder 06 for fastening dressings 01, wherein the openings 09 are arranged on the circumference of the cylinder 06, for example offset by 180° in respect to each other, if two dressing 01 are to be arranged behind each other along its circumference. With this covering of the cylinder 06 with two dressings 01 arranged behind each other, the leading end 03 of the one dressing 01 is fastened

in the one groove 08, while the trailing end 04 of the same dressing 01 is fastened in the other groove 08. This applies correspondingly to the one or the remaining dressings 01 arranged on this cylinder 06. If several dressings 01 are arranged side-by-side in the axial direction of the cylinder 06, these can advantageously also be arranged offset in respect to each other. The offset can involve, for example, individual dressings 01, or groups of dressings 01, each of which is arranged offset, for example by half the length L of the dressing 01 which, however, requires that further grooves 08 with associated openings 09, or at least partial elements of the same, are cut into the cylinder 06, which are arranged along the circumference of the cylinder 06 offset by 90°, for example, in relation to the previously mentioned grooves 08 and openings 09.

The method for mounting of a flexible dressing 01 on a cylinder 06 of a printing press will be described by way of example in what follows, wherein two dressings 01 can be arranged one behind the other along the circumference of the cylinder 06, and wherein each dressing 01 has, related to the production direction P of the cylinder 06, a leading end 03 and a trailing end 04 (Fig. 3). A suspension leg 13 is formed at the leading end 03 of the dressing 01, wherein this suspension leg 13 is beveled at an opening angle $\alpha 1$ of maximally 90°, preferably 45°, in respect to the linear length L of the dressing 01. At least one, preferably slit-shaped opening 09 with, viewed in the production direction P of the cylinder 01, a first edge 16 and a second edge 17, is provided in the cylinder 06, wherein the edges 16, 17 preferably extend parallel in respect to each other in the axial direction of the cylinder 06. The leading end 03 of the dressing 01 is brought to the cylinder 06, preferably tangentially in

respect to its production direction P, for example by means of a thrusting force acting on the trailing end 04 of the dressing 01, until the suspension leg 13 at the leading end 03 is located behind the second edge 17 of the opening 09 on the cylinder 06, so that in the course of a rotation of the cylinder 06 in its production direction P the suspension leg 13 formed on the leading end 03 engages the opening 09 as a result of a radial force FR, which acts at least on the leading end 03 and which is directed toward the cylinder 06, and is hooked on the first edge 16. In the case where the dressing 01 rests, supported by its suspension leg 13 formed on its leading end 03, on the surface 07 of the cylinder 06, the radial force FR can be, for example, the gravitational force FG of the dressing acting on the surface 07 of the cylinder 06.

In addition to using the gravitational force FG of the dressing 01, or alternatively thereto, the leading end 03 of the dressing 01 can be elastically pre-stressed (Fig. 4), so that the suspension leg 13 formed on the leading end 03 springs into the opening 09 as a result of a restoring moment MR directed to the cylinder 06 as soon as the opening 09 of the cylinder 06 and the contact line 27 of the suspension leg 13 with the surface 07 of the cylinder 06 are located directly opposite each other because of a relative movement between the dressing 01 and the cylinder 06, wherein the relative movement occurs in particular because of the rotation of the cylinder 06 in the production direction P.

The restoring moment MR results because the dressing 01 is made of an elastically deformable material and therefore inherently has an elastically resilient property, wherein this property is used in such a way that, in the course of being brought to the cylinder 06, the leading end 03 of the dressing 01

is conducted, for example, over an edge 26, which preferably extends axially in respect to the cylinder 06 and is arranged spaced apart from the cylinder 06, on a support element 24 and is bent there in such a way that a bending stress with a spring force (representation of the dressing 01 in dashed lines in Fig. 4) directed toward the cylinder 06 is built up at the leading edge 03 of the dressing 01. At least until the leading end 03 of the dressing 01 which is conducted over the edge 26 of the support element 24 rests on the surface 07 of the cylinder 06, the trailing end 04 of dressing 01 is fed in from a spatial direction which is fixed toward the cylinder 06. Accordingly, the dressing 01 is stabilized during the mounting process by the contact line 27 of its suspension leg 13 attached to the leading end 03 with the surface 07 of the cylinder 06, as well as by its support on the edge 26 of the support element 24, and by a positional fixation device 28 of the trailing end 04. The support element 24 can be embodied, for example, as a roller element 24, in particular as a roller 24, or as one, or several rollers 24, which are arranged axially side-by-side in respect to the cylinder 06, can be placed against the cylinder 06, for example, and function in the manner of a contact pressure element 24. The support element 24 is preferably arranged close to the cylinder 06.

The leading end 03 of the dressing 01 can also be brought against the cylinder 06 in such a way that, following its contact with the surface 07 of the cylinder 06, this end 03 faces away from the surface 07 of the cylinder 06 at an acute angle gamma of an imagined second tangent line T29, which rests on a contact point 29 on the surface 07 of the cylinder 06 (representation of the dressing 01 in solid lines in Fig. 4). However, the bending of the leading end 03 of the dressing 01 should only be so large

that the suspension leg 13 arranged there still rests dependably against the surface 07 of the cylinder 06. To assist the dependable resting of the suspension leg 13 against the surface 07 of the cylinder 06, it is possible, for example, to bring the support element 24 into contact with the dressing 01, so that the leading end 03 of the dressing 01 is maintained close to the surface 07 of the cylinder 06.

In the course of the relative movement between the cylinder 06 and the dressing 01, preferably in the course of the rotation of the cylinder 06 in its production direction P, but also in the course of a suitable movement of the dressing 01 as well, for example counter to the production direction P of the cylinder 06, the suspension leg 13 is hooked at the first edge 16 of the opening 09 on the leading end 03 of the dressing 01. A roller element 24 placed against the cylinder 06 can then aid the mounting of the dressing 01 on the cylinder 06 in that the roller element 24 rolls the dressing 01 up on the cylinder 06. The suspension leg 14 is embodied on the trailing end 04 of the dressing 01 wherein, in the course of rolling the dressing 01 up on the cylinder 06, this suspension leg 04 is pushed into the opening 09 of the cylinder 06 by the roller element 24.

A device for executing the above method will now be explained by means of the example of a web-fed offset printing press with, for example, a vertical rubber-against-rubber printing group of four-cylinder construction with, for example, the horizontal guidance of a material 48 to be imprinted, preferably a paper web 46 (Fig. 5). In this example, a first pair of cylinders 31, 32, which roll off on each other and are arranged underneath the paper web 46 and consist of a forme cylinder 31 and a rubber blanket cylinder 32, and a second pair of cylinders 33, 34, which

roll off on each other and are arranged above the paper web 46 and consist of a forme cylinder 33 and a rubber blanket cylinder 34, are provided in the printing group, wherein the paper web 46 is conducted between the two rubber blanket cylinders 32, 34, which have been placed against each other. Preferably several, for example five or six, print locations for different colored ink are provided in the printing press. In what follows it is assumed for the sake of simplicity and without limiting the invention, that at least the forme cylinders 31, 33 are identical in type and in their dimensions.

The forme cylinder 31 is covered along its circumference with two printing formes 36, and the forme cylinder 33 is covered, or at least can be covered, in the same way with two printing formes 37, wherein the printing formes 36, 37 have a length L corresponding, for example, to half the circumference of the forme cylinders 31, 33. The width of the printing formes 36, 37 depends inter alia on how many printing formes 36, 37 are to be arranged in the axial direction of the respective forme cylinders 31, 33. Thus, up to six printing formes 36, 37, for example, can be arranged side-by-side in the axial direction of the respective forme cylinder 31, 33. The forme cylinders 31, 33 are preferably embodied to be of double width and double circumference, while, for example, printing blankets arranged on the rubber blanket cylinders 32, 34 are braced over the entire circumference of the rubber blanket cylinders 32, 34.

As already shown in Figs. 1 and 2, the printing formes 36, 37 have beveled suspension legs 13, 14 on their front ends in respect to the length L, with which the printing formes 36, 37 are fastened to the respective forme cylinders 31, 33 in that the suspension legs 13, 14 are introduced into one of the slit-shaped

openings 09, which have been cut into the surface of the forme cylinders 31, 33 and extend in the axial direction in relation to the forme cylinders 31, 33 and are possibly held there by means of a holding device arranged in the forme cylinder 31, 33, preferably in a groove 08. The opening angle α1 between the beveled suspension leg 13 at the leading end 03 of each printing forme 36, 37 and the linear length L of the printing forme 36, 37 is preferably 45°. At the trailing end 04 of each printing forme 36, 37, the opening angle ß1 between the beveled suspension leg 14 and the linear length L of the printing forme 36, 37 is preferably 90°. The slit width S of the openings 09 cut into the forme cylinders 31, 33 preferably is 1 mm to 5 mm, in particular 3 mm.

For changing one or several of the printing formes 36, 37 placed on the forme cylinders 31, 33, a first printing forme magazine 38, arranged underneath the paper web 46, is for example provided for the forme cylinder 31, and for the forme cylinder 33 a second printing forme magazine 39, which is arranged above the paper web 46, wherein each printing forme magazine 38, 39 has a receiving arrangement 41, 42, for example a chute 41, 42, for receiving at least one used printing forme 36, 37 to be removed from the respective forme cylinder 31, 33, and a receiving arrangement 43, 44, for example a chute 43, 44, for receiving a fresh printing forme 36, 37 to be mounted on the respective forme cylinder 31, 33, wherein preferably each receiving arrangement 41, 42, 43, 44 preferably has several storing positions, respectively for used printing formes 36, 37 to be removed and for fresh printing formes 36, 37 to be mounted. While the printing forme magazine 38, 39 assigned to the respective forme cylinder 31, 33, for example, is placed, for example, against the respective forme cylinder 31, 33 for changing a printing forme 36, 37, the first

forme cylinder 31 and the second forme cylinder 32, for example, are moved out of contact with their respective rubber blanket cylinder 32, 34 with which they are operatively connected. Alternatively, or additionally, to the out-of-contact forme cylinders 31, 33, the rubber blanket cylinders 32, 34 can also be taken out of contact with the paper web 46. In this way the respective forme cylinder 31, 33 is uncoupled from the paper web 46 during the change of one or several printing formes 36, 37, while the other pair of cylinders 32, 34 can remain in production in the printing group.

The chutes 41, 43, or 42, 44, for receiving at least one used or fresh printing forme 36, 37 are advantageously arranged in the printing forme magazines 38, 39 at least substantially parallel with each other, i.e. they are preferably arranged on top of each other in a layered construction. In this case a separating wall 47, for example, in the respective printing forme magazine 38, 39 can separate the chutes 41, 43, or 42, 44, from each other (Fig. 5). Each of the chutes 41, 43, or 42, 44, has at least two storage positions for the printing formes 36, 37 to be stored in them. In order to make possible easy access to chutes 41, 43, or 42, 44, even when the paper web 46 is running, for example for removing a used printing forme 36, 37 from the chutes 41, 42, or for making a fresh printing forme 36, 37 available in the chutes 43, 44, these chutes 41, 43, or 42, 44, are accessible from the side facing away from the forme cylinder 33, or from a side of the printing forme magazines 38, 39 which extends parallel with the running direction of the paper web 46. Each of the printing forme magazines 38, 39 preferably extends over the length of the barrels of the forme cylinders 31, 33, but at least over the width B of the printing forme 36, 37, and are capable of

receiving a printing forme 36, 37, preferably completely, i.e. in accordance with their length L, in their respective chutes 41, 43, or 42, 44. The chutes 41, 43, or 42, 44, are placed into a housing, for example, wherein the housing has an opening o38, o39, and wherein each of the openings o38, o39 can be aligned parallel with the barrel of the respective forme cylinder 31, 33. A printing forme 36, 37 can be fed via the respective openings o38, o39 to the forme cylinder 31, 33, or can be introduced from the latter into the chute 41, 43. For this purpose, the openings o38, o39 of the printing forme magazines 38, 39 are moved toward the forme cylinders 31, 33 at a clearly reduced distance a38, a39 in relation to an opening 09 in the forme cylinders 31, 33, than the length L of the printing forms 36, 37. Advantageously, the distances a38, a39 have between 2% and maximally 50% of the length L of the printing formes 36, 37, in particular short distances a38, a39 of up to 10% of the length L. It is advantageous to arrange at least the printing forme magazine 39, which is arranged above the paper web 46, to be movable, so that this printing forme magazine 39 can be brought or pivoted into a working position against the forme cylinder 33 from a position of rest arranged preferably above the printing group. An improved accessibility to the printing group results from this movable arrangement of the printing forme magazines 38, 39, for example for performing work required there, for example maintenance work. In the working position, the chutes 41, 43, or 42, 44 of the printing forme magazines 38, 39, but at least the storage positions of the printing formes 36, 37, are preferably arranged to be horizontal, or with a slight inclination, preferably of less than 15° in relation to the horizontal line H, wherein the openings o38, o39 of the printing forme magazines 38, 39 preferably point towards

one of the openings 09 in that forme cylinder 31, 33, with which the respective printing forme magazine 38, 39 works together.

A movably arranged printing forme magazine 38, 39 can be fixed in place in its work position in front of a forme cylinder 31, 33 at a distance a38, a39 and in alignment with the forme cylinder 31, 33, by means of an arresting device 48 (Fig. 5). The arresting device 48 can be formed, for example, by means of a conical bolt which is fixed in place, for example in respect to the forme cylinder 31, 33, engages an opening in the housing of the printing forme magazine 38, 39, and centers the openings a38, a39 of a printing forme magazine 38, 39, for example pivoted against the forme cylinder 31, 33, in respect to the barrel of the forme cylinder 31, 33. It is advantageous to bring the forme cylinder 31, 33 into a predetermined position in accordance with the side register, to zero it in, for example in respect to the side register, before an exchange of a printing forme 36, 37 takes place between the forme cylinder 31, 33 and the printing forme magazine 38, 39. Alternatively to the setting of the forme cylinder 31, 33, the printing forme magazine 38, 39 can also be brought into a predetermined lateral position in relation to the forme cylinder 31, 33, so that the correctly aimed exchange of a printing forme 36, 37 between the printing forme magazine 38, 39 and the forme cylinder 31, 33 can take place without lateral offset.

It is advantageous to arrange a hingedly seated, preferably pivotable guide plate 49 (Fig. 5) near the forme cylinder 33 in front of the opening of the printing forme magazine 39, which can be directed toward the forme cylinder 33, by means of which a trailing end 04 of a printing forme 37 released from an opening 09 in the forme cylinder 33 is conducted, correctly aimed, to the

chute 42 for receiving the printing forme 37 to be removed. In particular, an erroneous access for a printing forme 37 to be removed from the forme cylinder 33 to the chute 44, in which at least one fresh printing forme 37 is made available, or can be made available, is blocked by means of the guide plate 49. The application of a guide plate 49 at the printing forme magazine 38 which is arranged underneath the paper web 46 and works together with the forme cylinder 31, can also be advantageous, but for reasons of clarity it is not represented in Fig. 5.

A further exemplary embodiment of a printing press with printing forme magazines results in connection with a printing press, for example a multi-color offset printing press, whose printing groups are preferably arranged on top of each other in a bridge construction, or a compact figure-eight construction, in at least one frame 97 on a base 96, i.e. a printing press of low structural height with eight print positions, such as is shown by way of example in Fig. 36. The material 46 to be imprinted, preferably a paper web 46, is fed here to the printing press and is conducted vertically through the printing groups. Four printing groups following each other in the transport direction of the paper web 46 are represented by way of example in Fig. 36, which have respectively a transfer cylinder 32, 34 with a forme cylinder 31, 33 to the right and left of the paper web 46, wherein the transfer cylinders 32, 34, which are oppositely located at the paper web 46 in a printing group, roll off on each other. The paper web 46 is brought to the first printing group, for example by means of a first paper guide roller 92 arranged ahead of the first printing group, and is conducted away from the fourth printing group by means of a second paper guide roller 93 arranged downstream of the fourth printing group. At least one inking

system 94, whose details will not be covered here in detail, is assigned to each forme cylinder 31, 33. A printing forme magazine 38, 39 is assigned to each forme cylinder 31, 33, each of which preferably has two chutes 41, 42, 43, 44. In the same way as in the exemplary embodiment described above in connection with Fig. 5, in the working position, each printing forme magazine 38, 39, but at least its storage position for a printing forme 36, 37 to be stored, is here also aligned, preferably substantially horizontally, or with only a slight inclination of less the 15°, in respect to the forme cylinder 31, 33. In the working position of the printing forme magazine 38, 39, at least one printing forme 36, 37 can be exchanged between the chutes 41, 42, 43, 44 and the forme cylinder 31, 33, in that either a printing forme 36, 37 no longer needed for executing a printing job is removed from the forme cylinder 31, 33 and inserted into the chute 41, 42, or a fresh printing forme 36, 37 is taken out of the chute 43, 44 and mounted on the cylinder 31, 33 for executing the printing job. In this exemplary embodiment, the structural characteristics of the printing forme magazines 38, 39 can correspond to those in the exemplary embodiment previously described in connection with Fig. 5. It is advantageous if the operation, in particular the execution of a printing forme change, is monitored by sensors. Simultaneously, the printing forme magazine 38, 39, together with the forme cylinders 31, 33, can be controlled in such a way that a printing forme change can be selectively initiated, preferably from a control console assigned to the printing press. Because the printing forme magazines 38, 39 can be prepared for a printing forme change during the running production of the printing press, a set-up time requiring a downtime of the printing press for a printing forme change is reduced to an extremely short period of

time of, for example, less than two minutes, preferably less than ninety seconds, for a complete change of all printing formes 36, 37 of the printing groups arranged in this printing press. Depending on the design of the printing groups, ninety-six printing formes 36, 37 can be simultaneously employed in the described printing press, for example. Such a rapid printing forme change, even with an increased number of printing formes 36, 37, considerably increases the efficiency of the printing press because of its extremely short downtime.

Further details regarding a method and a device for executing the method will now be explained by way of example by means of Figs. 6 to 35. Here, Fig. 6 shows a forme cylinder 33 with two grooves 08, offset by 180° along the circumference, and two printing formes 37 arranged one behind the other along the circumference, wherein the suspension leg 14, which is beveled at right angles, is maintained at the trailing end 04, viewed in the production direction P of the forme cylinder 33, of each printing forme 37 by a holding means 21, which is arranged in a groove 08 and is charged with pressure by a spring element 22, on a wall 19, wherein the wall 19 extends from a rear edge 17 of an opening 09, which opens the groove 08, toward the groove 08, wherein the holding means 21 can be released by actuating a pneumatic actuating means 23, which acts opposite the spring element 22. At the wall 18, extending from the front edge 16 of the same opening 09 to the groove 08, the suspension leg 13, which is beveled at an acute angle, is placed with positive contact against the leading end 03 of the other printing forme 37, which is arranged along the circumference of the forme cylinder 33. For details of the holding of the printing forms, reference is made to Fig. 2.

Moreover, Fig. 6 shows a contact pressure element 24 in the form of a contact pressure cylinder 24 or contact pressure roller 24, which can be placed against the forme cylinder 33 by pneumatic activation. In the same way, an alignment device 51 with two diametrically arranged, wing-shaped stops 52, 53 acting laterally on the printing forme 37, is provided near the forme cylinder 33 and is pivotably seated parallel to the axial direction of the latter, wherein, by means of respectively one of its stops 52, 53, the alignment device 51 temporarily fixes a printing forme 37 to be mounted in place in respect to the side register while it is brought to the forme cylinder 33. In this case the stops 52, 53 are each designed, for example, as lateral guide plates, wherein the stops 52, 53 are arranged, for example, on a pivotable cross bar, for example a square tube. The stops 52, 53 differ, for example, in their position in respect to the axial direction of the forme cylinder 33, so that, for example for a printing forme 37 of single width, the stop 52 is employed, and for a printing forme 37 in panorama format the stop 53 is employed by an appropriate pivoting of the alignment device 51. The stops 52, 53 can be adjusted axially in respect to the forme cylinder 33 for the required width of the printing forme 37.

Further details of the printing forme magazine 39 can also be taken from Fig. 6. The exemplary embodiment represented in Figs. 6 to 35 is based on a variation of the printing forme magazine 39, wherein an upper chute 44 for making available a printing forme 37 to be mounted on the forme cylinder 33 can be operated as an autonomous structural unit independently of a lower chute 42 for receiving a printing forme 37 removed from the forme cylinder 33. Both chutes 42 and 44 can be used as individual structural units, which can be employed independently of each

other and are therefore autonomously functional. This application is of interest, for example, if only the feeding of the forme cylinder 33 with fresh printing formes 37 is to be automated, while the removal of used printing formes 37 is performed by an operator. If both chutes 42, 44 are embodied in the printing forme magazine 39, a fully automatic printing forme changer results. Both chutes 42, 44 each have all devices required for storing and conveying printing formes 37 and are preferably very compactly constructed. In particular, they have a low structural height in spite of their being capable of receiving at least two printing formes 37. The structural height is for example less than 150 mm, preferably less than 100 mm.

In the exemplary embodiment represented in Figs. 6 to 35, the chute 44 is horizontally arranged and is aligned tangentially to. In this way the gravitational force FG exerted on the printing forme 37 is used in the best possible way for aiding the functions described in what follows. A support 54, on which the beveled suspension legs 13, 14 of a first printing forme 37 to be mounted on the forme cylinder 33 can be set or placed, is located in the chute 44. A printing forme 37 placed on the support 54 rests thereon, for example, with its entire linear length L. Preferably the support 54 is not embodied as a solid surface, but in the form of parallel strips 54 or sliding rails 54. The suspension leg 14 at the trailing end 04 of the first printing forme 37 rests in the chute 44 on the side facing away from the forme cylinder 33 against a stop 56, which preferably extends vertically, wherein the stop 56 can be moved by a conveying device 57 linearly and parallel with the support 54 in the direction toward the opening o39 of the printing forme magazine 39 for the purpose of conveying this first printing forme 37 out of the chute

44 by means of a translatory movement, and preferably free of deformation, at least long enough that the suspension leg 13 can engage the slit-shaped opening 09 of the forme cylinder 33 at the leading end 03 of this first printing forme 37. In this way the stop 56 is used as the contact position for the first printing forme 37 in the chute 44, and simultaneously also has the function of a pusher 56. As soon as this first printing form 37 has at least one register stamping at the suspension leg 14 on its trailing end 04, the stop 56 can also be advantageously embodied, for example, as a register pin 56, which extends perpendicularly in respect to the support 54 and is connected with the conveying device 57, so that with placing the first printing forme 37 against the stop 56, its pre-registration in respect to is side register takes place. The conveying device 57 is embodied, for example, as a belt drive 57, or as a linear drive mechanism 57, preferably as a pneumatic linear drive mechanism 57, in particular as a linear drive mechanism 57 without a piston rod, which acts double-sided.

A holder 58, in particular a printing forme holder 58, is located in the chute 44, for holding at least one second printing forme 37 to be mounted on the forme cylinder 33. As represented in Fig. 13, the second printing forme 37 is held by the printing forme holder 58 above the support 54, i.e. at a distance a54 above the support 54, for example in a way, wherein the printing form holder 58 has, for example on the side facing away from the forme cylinder 33, a piston 59 or pusher 59, which can be displaced parallel in respect to the support 54 and at whose end a holding element 61, for example an L-shaped elbow 61, is arranged, so that the second printing form 37 is clamped between the elbow 61 of the extended pusher 59 and a further holding element 62, for example a

rigidly arranged stop 62, arranged in the area of the opening o39 of the printing forme magazine 39. In this case the distance a54 has a value which preferably lies between twice or four times the length l14 of the suspension leg 14 at the trailing end 04 of the second printing form 37. Clamping of the second printing forme 37 is provided in that a free distance a58 between the elbow 61 of the extended pusher 59 and the stop 62 is set to be shorter than the linear length L of the second printing forme 37. Preferably the stop 62 in the area of the opening o39 of the printing forme magazine 39 has an inclined face 63, on which the suspension leg 13 can be supported against the leading end 03 of the second printing forme 37, wherein the inclined face 63 of the stop 62 and the L-shaped elbow 61, on which the suspension leg 14 is supported on the trailing end 04 of the second printing form 37, face each other. Since the second printing form 37 is flexible, in particular along its length L, it arches in the state where it is clamped between the elbow 61 and the stop 62. The pusher 59 of the printing forme holder 58 is preferably movable parallel in respect to the support 54 and preferably has two stable operating positions, namely a stable operating position in the retracted state, in which the second printing forme 37 is released, and in the extended state, i.e. clamping the second printing forme 37. In a variation of the printing forme holder 58, the arrangement of the movable pusher 59 and the rigid stop 62 have been interchanged with each other, so that the pusher 59 is located in the area of the opening o39 of the printing forme magazine 39, and the stop 62 on the side facing away from the forme cylinder 33. Alternatively to the described linear mobility, the elbow 61 of the stop 62 can also be arranged to be pivotable around a pivot axis aligned parallel with the width B of the printing forme 37. A printing

forme 37 clamped between the elbow 61 and the stop 62 is in its upper, or first storage position, while in this state a printing form 37 deposited on the support 54 takes on a lower, second storage position, wherein the printing forme 37 is temporarily stored in the second storage position prior to its conveyance to the forme cylinder 33. By means of an actuating element, preferably an actuation by remote control, for example from a control console, which is part of the printing press, the printing forme 37 changes inside the chute 44 from its upper, first storage position into it lower, second storage position. Printing formes 37 stored in the first storage position and the second storage position are spaced apart from each other, for example along their length L at the distance a54, so that they cannot touch each other and therefore not damage each other.

A further exemplary embodiment of the printing forme holder 58, which advantageously permits a particularly low structural height of the chute 44, provides for the second printing forme 37 to be maintained above the support 54, which extends on a single plane in the axial direction of the forme cylinder 33 in an upper storage position, by means of at least one holding element 64, wherein the holding element 64 is designed, for example, as a guide rail 64, preferably two guide rails 64 extending parallel with each other (Figs. 7 to 9), wherein the guide rails 64 maintain the second printing forme 37 present in the chute 44 in the upper storage position on its two longitudinal sides over at least a portion of their length L. The embodiment of the printing forme holder 58 with guide rails 64 assumes that, by not extending as far as the longitudinal sides of the printing forme 37, the suspension legs 13, 14 at the ends 03, 04 of the second printing forme 37 do not extend over the full length B of

the printing forme 37. Therefore the longitudinal sides of the printing forme 37 provide a projection in the area of the bearing area 02 past the suspension legs 13, 14. This projection is necessary for making the guidance of the printing forme 37 in the guide rails 64 possible. The holding element 64, in particular each guide rail 64, consists for example of a U-shaped bracket, which extends around each of the longitudinal sides of the printing forme 37 with a certain amount of play and into which the second printing forme 37 can be inserted from the side facing away from the forme cylinder 33. Thus, the second printing forme 37 is preferably maintained by the guide rails 64 in a narrow area of its side, wherein the holder acts in particular as a vertical support, and therefore as a support against the gravitational force FG acting on the printing forme 37. Preferably the guide rails 64 are made of a dimensionally stable material, such as a metal or plastic material.

For depositing a second printing forme 37 maintained in the guide rails 64 on the support 54, at least one of the guide rails 64 is movable in the direction of the width B of the second printing forme 37. However, preferably both guide rails 64 are movable in opposite directions along the width B of the second printing forme 37, so that they move away from each other, at least for a short period of time, and increase their distance from each other in such a way that they no longer support the longitudinal sides of the printing forme 37 vertically, so that the second printing forme 37 falls between the guide rails 64 onto the support 54 because of the gravitational force FG acting on it. If in a first operational mode the holding element 64 holds the second printing forme 37 in the upper storage position by means of an electrical or magnetic force, for example, the holding element

64 changes, preferably by remote control, from a first operational state into a second operational state, wherein the second operational state causes the holding element 64 to release the printing forme 37 from the holding element 64, so that in the course of being released from the holding element 64 the printing forme 37 changes by free falling in the chute 44, and therefore only because of the gravitational force FG acting on it, into the storage position which preferably is located directly vertically underneath the upper storage position. In the upper, as well as in the lower storage position, the second printing form 37 is held in the chute 44 with an inclination of less than 15°, preferably horizontally. At least the longitudinal extension of the guide rails 64 embodied as support bearings for the second printing forme 37 have only this slight inclination, or extend horizontally.

The release of the second printing forme 37 from the guide rails 64, which act laterally on it, is preferably aided by a stop 67, which extends perpendicularly in relation to the bearing area 02 of the second printing forme 37 and which is preferably arranged rigidly in the chute 44, wherein such a stop 67 is preferably arranged at both longitudinal sides of the second printing form 37, so that in the course of a movement in opposite directions of the guide rails 64 which hold this printing forme 37, which is directed along the width B of the second printing forme 37, this second printing plate 37 remains in a stable position in the plane defined by the bearing area 02 because of the stops 67 arranged on both sides. The stops 67 push the printing forme 37 off the guide rails 64, which move away from each other, in that the printing forme 37 comes into contact with the stops 67, wherein simultaneously the vertical support of the

printing plate 37 is removed by the movement of the guide rails 64. The release of the second printing forme 37 is preferably performed by a drive mechanism 69, for example, which is operated by remote control from the control console which is a part of the printing press, wherein the drive mechanism 69 acts on the guide rails 64 and moves them along an actuating path s68.

If several printing formes 37 are to be arranged side-by-side in the axial direction on the forme cylinder 33, and several printing formes 37 are arranged side-by-side in the axial direction of the forme cylinder 33 in the chute 44, it is advantageous to arrange the guide rails 64, which act on adjoining printing formes 37, in the printing forme magazine 39 on two different levels above the support 54, i.e. vertically offset in relation to each other, wherein successive levels are preferably alternatingly offset in the axial direction of the forme cylinder 33. By means of the offset arrangement of the levels, which constitute the first storage position of the printing formes 37, it is possible to keep a distance a67 between printing formes 37, which are arranged side-by-side in the axial direction of the forme cylinder 33, i.e. next to each other, as short as possible. The value of the distance a67 preferably corresponds to a distance which printing formes 37 have, which are arranged side-by-side on the forme cylinder 33 in the axial direction of the latter, i.e. adjoining printing formes 37. Printing formes 37 placed on the support 54 from levels which are arranged side-by-side in the axial direction of the forme cylinder 33, i.e. respectively from a first storage position, and therefore have been brought into their second storage position, can be conducted, either individually or preferably together at the same time, to the forme cylinder 33 by means of the conveying device 57, wherein the latter method is

advantageous for a rapid change of printing formes 37 at the forme cylinder 33. Printing formes 37 stored in the axial direction of the forme cylinder 33 in different side-by-side arranged levels can be changed at the same time, or at least in rapid succession, into their respective second storage positions. Printing formes 37 fed simultaneously together to the forme cylinder 33 are arranged side-by-side on the forme cylinder 33 in its axial direction.

In the example represented in Fig. 8, four second printing formes 37 have been arranged in their respective first storage positions side-by-side in the axial direction of the forme cylinder 33, wherein each one of these printing formes 37 is maintained at its respective longitudinal sides in a guide rail 64. Here, the vertical offset of the printing formes 37 is only a few millimeters, for example 4 mm to 6 mm, and approximately corresponds to the structural height of the guide rails 64, preferably their single or double structural height. The movement of the guide rails 64 longitudinally in relation to the width B of the second printing forms 37 is provided, for example, by a linear displacement of the guide rails 64; however, it can also be performed by a pivoting movement of the guide rails 64, wherein the guide rails 64 are pivotable around a pivot axis and wherein the pivot axis extends parallel in respect to the side of the printing forme 37 supported by the guide rails 64. For example, a guide rail 64 can be attached to at least one pivot arm 68 which, for example, is pivotable in the plane defined by the bearing area 02 of the second printing forme 37, which is indicated by a directional arrow in Fig. 9. The pivot arm 68, whose one end is connected with the guide rail 64, and whose other end is preferably fixed in place in the chute 44, can for example be

designed as a spring element 68, for example a leaf spring 68, which acts laterally on the guide rail 64, wherein the guide rail 64 connected with the pivot arm 68 is moved by the drive mechanism 69, for example a controllable, in particular remotely controllable, magnet 69, into an operational position in which it holds the second printing forme 37, or into an operational position, wherein it is released from this printing forme 37. The actuating path s68 performed by a movable guide rail 64 longitudinally in respect to the width B of the second printing forme 37 lies within the range of a few millimeters, for example between 2 mm and 10 mm, preferably at 4 mm. A stop 67 is also preferably provided in this embodiment variation, into which the printing forme 37 comes into contact with its side supported by the guide rail 64, while the guide rail 64 removes this support of the printing forme 37 by being moved. Two printing formes 37, which adjoin each other in the axial direction of the forme cylinder 33, can here come into contact with opposite sides of the same stop 67. In the course of changing from the upper storage position into the lower storage position, , the printing forme 37 can also glide along the stop 67 with one of its sides directed vertically downward, so that the printing forme 37 released from its upper position reaches the lower storage position by a guided movement. In this case, with a printing forme 37 changing its storage position, the stop 67 fulfills the function of a lateral guidance, which preferably extends as far as the support 54.

Expressed generally, a method for storing at least two dressings 01, 36, 37, which are sequentially removed from the same cylinder 06, 31, 33 of a printing press, provides the following steps: a) a dressing 01, 36, 37, previously removed from a cylinder 06, 31, 33, is conveyed from a first into a second

storage position, b) the dressing 01, 36, 37 removed following the previously removed dressing 01, 36, 37, is stored in the first storage position of the previously removed dressing 01, 36, 37, c) the previously removed dressing 01, 36, 37 in its second storage position, and the subsequently removed dressing 01, 36, 37 in its first storage position of the previously removed dressing 01, 36, 37, are stored at a distance, which is orthogonal along their length L, d) the dressings 01, 36, 37 are stored with their respective bearing areas 02 at least largely overlapping, preferably overlapping by 80%, or with their complete or almost complete overlap. The previously removed dressing 01, 36, 37, and the subsequently removed dressing 01, 36, 37, can now be stored vertically along their length L, or also spaced apart horizontally from each other. The previously removed dressing 01, 36, 37 is preferably conveyed into its second storage position by means of a linear movement, in particular a linear movement which connects both storage positions immediately and directly with each other, orthogonally in respect to its bearing area 02, or also by a movement of its trailing end 04, which will be explained in greater detail later.

It is advantageous to arrange a code reader 71, in particular in the chute 44, for example at the pusher 56, for a first printing forme 37 resting on the support 54, or also at the L-shaped elbow 61 for a second printing forme 37, which reads a code, preferably applied to the suspension leg 14 at the trailing end 04 of each printing forme 37, i.e. it detects a characteristic for identifying a printing forme in order to check by means of a comparison, preferably electronically performed in a control unit by means of an allocation plan provided for the forme cylinder 33 stored in the control unit, whether the printing formes 37 placed

into the chute 44 correspond to the allocation plan of the intended printing process, and whether the printing formes 37 introduced into the chute 44 for intended allocation are present in the required order. In this way it is possible, even prior to mounting the printing formes 37 on the forme cylinder 33, to generate an appropriate report, for example an error report, i.e. a report warning the operator of an erroneous mounting, and to feed it to a control console, for example assigned to the printing press, and to display it there or at the printing group.

Preferably the coding can additionally be in the form of a code which can be read by humans, for example a bar code. Therefore the code reader 71 is preferably arranged in the chute 44 at its end facing away from the forme cylinder 33, wherein a reading direction of the code reader 71 is either oriented parallel with the length L of the printing forme 37, or preferably parallel with the width B of the printing forme 37. In a preferred embodiment, the code reader 71 is arranged, preferably movable by means of a linear guide, in or at the chute 44, or a movable mirror is provided, which preferably is inclined by 45° in relation to the width B of the printing forme 37, which changes the direction of a detection or reading signal from a coding attached to the printing forme 37 to a code reader 71 arranged at the side of the chute 44, so that only a single code reader 71 is necessary for reading the codes applied to the printing formes 37 stored in the chutes 44. By using only a single code reader 71 for several stored printing formes 37 it is possible to save considerable costs. When employing only a single code reader 71, the code reader 71, or the mirror, can be either displaced parallel in respect to the width B of the printing forme 37, i.e. in the axial direction of the forme cylinder 33, preferably along

several chutes 44, and/or vertically in height along the printing formes 37 stacked in one of the chutes 44, so that the code reader 71, or the mirror, detects the coding on printing formes 37 stored in different storage positions. Either the code reader 71, or at least one further sensor 91, can be used for monitoring and/or checking whether an intended printing forme change has been successfully performed. Errors, such as a double allocation or an erroneous allocation, i.e. the mounting of the printing forme 37 at an inappropriate location, can then be avoided, or are at least detectable by means of a report preferably directed to the control console of the printing press, before extensive damage occurs.

A further chute 42 is represented in Fig.6, which is used for receiving printing formes 37 removed from the forme cylinder 33. This chute 42 has a support 72 which, for example, is inclined and which, the same as the support 54 in the chute 44, is preferably embodied not as a solid surface, but in the form of parallel strips 72 or sliding rails 72, for making available printing forms 37 to be mounted on the forme cylinder 33, wherein the inclination of the support 72 widens the chute 42, preferably on the side facing away from the forme cylinder 33, so that this chute 42 is easier to access by an operator on the side facing away from the forme cylinder 33, which makes the removal of printing formes 37 stored in the chute 42 easier. The support 72 in the chute 42 can be inclined in respect to a horizontal line H by an inclination angle delta, wherein the inclination angle delta can lie between 5° and 15°, preferably approximately 7°. In the example represented in Fig. 6, the chute 42 for receiving printing formes 37 removed from the forme cylinder 33 is located below a chute 44 for making available printing formes 37 to be mounted on the forme cylinder 33, which, although it is a preferred

arrangement, is not absolute required. The chutes 42, 44 can also be layered in the opposite sequence, or arranged separated from each other.

A preferred embodiment of the chute 42 provides that at least two printing formes 37 can be stored side-by-side in the axial direction of the forme cylinder 33 in the chute 42. This embodiment makes a particularly rapid removal of printing forms 37 possible, in particular if at least two printing formes 37 can be arranged on the forme cylinder 33 in its axial direction, because several printing formes 37 can be removed simultaneously from the forme cylinder 33. If, for example, at least four printing formes 37 can be arranged on the forme cylinder 33 in its axial direction, it is advantageous for reasons of stability to arrange for example two chutes 42 side-by-side in the axial direction of the forme cylinder 33. Each storage space, defined by the width B of a printing forme 37, in one of these chutes 42 is then designed in such a way that at least as many printing formes 37 can be arranged there, as printing formes 37 can be arranged on the circumference of the forme cylinder 33, wherein the storage of the printing formes 37 at each storage space takes place in a stack on top of each other. It can be provided that up to ten, but at least up to eight, printing formes 37 can be stored in each one of the chutes 42, so that printing formes 37 removed from the forme cylinder 33 can be collected in the chutes 42, and the chutes 42 do not necessarily have to be emptied by the operator after each change of printing formes 37. Regardless of the number of chutes 42 arranged side-by-side, the storage spaces have the same close spacing from each other in the axial direction of the forme cylinder 33 as the printing formes 37 arranged on the forme cylinder 33.

On the side facing the forme cylinder 33, the chute 42 has a guide element 73 for receiving printing formes 37 removed from the forme cylinder 33 which, at least in the operational state, is arranged close to the surface 07 of the forme cylinder 33 and is embodied, for example, in the form of a guide plate 73, a wedge 73 or a rolling element 73, for example a roller 73, and whose purpose it is to guide the trailing end 04 of a printing form 73, which has been removed from the forme cylinder 33, into the chute 42. A distance a73 of the guide element 73 is preferably not much greater than the length l14 of the beveled suspension leg 14 at the trailing end 04 of the printing forme 37, the value a73 of the guide element 73 lies in particular between the single and twice the length l14 of the suspension leg 14 (Fig. 6). Since a printing forme 37 to be removed from the forme cylinder 33 touches the guide element 73 with its printed image side, its contact with a rotatably seated rolling element 73 is easier on its surface than sliding over a rigidly designed wedge 73. This aspect is of particular importance if the printing forme 37 is to be used again, so that damage of its side for the printed image because of scratches or grinding tracks should be prevented. A sensor 91 can be attached to the guide element 73 which checks, either in contact with the printing form 37 to be removed from the forme cylinder 33, or advantageously without contact, i.e. inductively, whether the suspension leg 14 at the trailing end 04 of the printing forme 37 to be removed from the forme cylinder 33 has in fact been released following the actuation of the holding means 21 arranged in the groove 08 of the forme cylinder 33. After its check, the sensor 91 sends a signal, for example to the control console of the printing press. A decision is made on the basis of the signal transmitted by the sensor 91 whether the process of

removing a printing forme 37 to be removed from the forme cylinder 33 can be continued, or whether steps for clearing up an interference must be initiated. Several sensors 91 are preferably provided on the guide element 73 in the axial direction of the forme cylinder 33, for example four or six, i.e. respectively one sensor 91 for each printing forme 37 which can be arranged side-by-side on the forme cylinder 33 in its axial direction.

In a preferred exemplary embodiment, after passing the guide element 73, the suspension leg 14 at the trailing end 04 of the printing forme 37 to be removed from the forme cylinder 33 preferably is placed on a first ramp 74, which is arranged at a distance from the guide element 73, before it reaches the support 72 in the chute 42, wherein the first ramp 74 initially rises in the direction of the support 72, and after a high point 76 descends again toward the support 72. The first ramp 74 is preferably rigidly connected with the support 72. Continuing the introduction of the printing forme 73 to be removed from the forme cylinder 33 into the chute 42, its suspension leg 14 at the trailing end 04 arrives at a second ramp 77, whose flank preferably descends abruptly steeply toward the support 72 after its high point 78, i.e. on the side facing away from the forme cylinder 33. In the direction in which the printing forme 37 is introduced into the chute 42, a detent 79, which the suspension leg 14 at the trailing end 04 of the forme cylinder 33 contacts, is arranged at a short distance a77 (Fig. 14) after the high point 78 and is rigidly connected with the second ramp 77. The distance a77 has a value of a few millimeters here, preferably a value of less than the simple length l14, in particular less than half the length l14 of the beveled suspension leg 14 at the trailing end 04 of the printing forme 37. When the suspension leg 14 at the

trailing end 04 of the printing forme 37 comes into contact with the stop 79, it preferably extends behind the second ramp 77 by means of the suspension leg 14 entering the intermediate space formed by the distance a77. The second ramp 77 and the stop 79 connected with it can be moved linearly and parallel with the support 72 by means of a conveying arrangement 81 for conveying the printing forme 37 to be removed from the forme cylinder 33 completely into the chute 42. The conveying arrangement 81 which, in particular together with the steep flank at the second ramp 77 for the beveled suspension leg 14 at the trailing end 04 of the printing forme 37, constitutes a moving device for conveying the printing forme 37 into the chute 42, is designed as a belt drive 81 or a linear drive 81, preferably a pneumatic linear drive, in particular a linear drive 81 acting double-sided without a piston rod. Both the first ramp 74, as well as the second ramp 77, are not made as full-sized planes, for example, but of several guide rails arranged parallel like the teeth of a comb. The second ramp 77 can be formed, for example, of one or several appropriately bent metal strips.

A lifting device 82, in particular a printing forme lifting device 82, is arranged in the chute 42 on the side facing away from the forme cylinder 33, wherein the printing form lifting device 82 has, for example, a piston 83, which can be shifted perpendicularly in respect to the support 72, at whose end a lifting arm 84, which is designed to be L-shaped, for example, in particular U-shaped, wherein the beveled suspension leg 14 at the trailing end 04 of the printing forme 37 is placed on the lifting arm 84, or placed so that it extends around it. Preferably the printing forme lifting device 82 has two stable operating positions, namely a stable operating position with the piston 83

retracted, in which the lifting arm 84 is located below the level defined by the support 72, and a further stable operating position with the piston 83 extended, in which the lifting arm 84 lifts the printing forme 37 which was removed from the forme cylinder 33, off the support 72. In the process, the printing form lifting device 82 performs a lift s82, which is greater than the length l14 of the beveled suspension leg 14 at the trailing end 04 of the printing forme 37. Preferably the lift s82 has a value between the single and double lengths l14 of the suspension leg 14. In this way the printing forme lifting device 82 lifts a printing forme 37 which had been removed from the forme cylinder 33, from a temporary first storage position into a final second storage position.

A securing element 86, which can be pivoted around a pivot axis extending substantially parallel in respect to the width B of the printing forme 37 and which has, for example, the shape of a strip-shaped flap 86, whose lower edge is at a distance a86 from the lifting arm 84, wherein the distance a86 preferably is less than the length l14 of the suspension leg 14 at the trailing end 04 of the printing forme 37, is arranged above the printing forme lifting device 82, in particular above its lifting arm 84. In Fig. 6 a directional arrow indicates the pivotability of the securing element 86. The securing element 86 secures a printing forme 37 lifted by the printing form lifting device 82 against inadvertent slipping in the chute 42, or removal from the chute 42. Thus, an operator must first pivot the securing element 86 before the lifted printing forme 37 can be removed from the chute 42.

A further exemplary embodiment of components arranged in the chute 42 is represented in Figs. 10 to 12. This exemplary

embodiment provides a stop 72, which is preferably rigidly arranged in the central area of the support 72, wherein a printing forme lifting device 82, which is connected to a conveying arrangement 81 which can be linearly moved along the support 72, lifts the beveled suspension leg 14 at the trailing end 04 of a printing forme 37 to be removed from the forme cylinder 33 over the support 72, and in its state where it is lifted by the printing forme lifting device 82, pulls the printing forme 37 to the end of the chute 42 facing away from the forme cylinder 33. The conveying arrangement 81 and the printing forme lifting device 82 can be forcibly connected in such a way that the printing forme lifting device 82 lifts the beveled suspension leg 14 of the printing forme 37 at a time at which the conveying arrangement 81 performs a movement in the direction facing away from the forme cylinder 33. Moreover, a further printing forme lifting device 87 is provided between the stop 79 and the end of the chute 42 facing the forme cylinder 33, which lifts the leading end 03 of a printing forme 37 which was removed from the forme cylinder 33 and inserted into the chute 42, sufficiently far, so that a further printing forme 37 to be removed from the forme cylinder 33 can be inserted into the chute 42 between the support 72 and the lifted printing forme 37.

Special methods for changing printing formes 37 on a forme cylinder 33 will now be explained by means of Figs. 13 to 35 in particular. It is assumed that the two printing formes 37 are arranged in the upper chute 44 for making available fresh printing formes 37 to be mounted on the forme cylinder 33, that two printing formes 37 are arranged along the circumference of the forme cylinder 37, and that, for receiving printing formes 37

removed from the forme cylinder 33, the lower chute 42 is empty, i.e. free of printing formes 37.

The forme cylinder 33 rotates the opening 09 of a groove 08, in which the suspension leg 14 at the trailing end 04 of the printing forme 37 to be removed from the forme cylinder 33 is maintained by a holding means 31, into a first position located below the guide element 73, which is a part of the lower chute 42. The controllable, preferably pneumatically operable contact pressure element 24 is placed against the forme cylinder 33 (Fig. 13).

The actuating means 23, which can preferably be operated pneumatically, pivots the holding means 21 against the force of a spring element 22, so that the suspension leg 14 at the trailing end 04 of the printing forme 37 snaps out of the opening 09 because of its elastic inherent tension and contacts the guide element 73. The contact pressure element 24 placed against the forme cylinder secures the printing forme 37 against further release from the shell 07 of the forme cylinder 33 (Fig. 14).

The forme cylinder 33 rotates opposite its production direction P and in the process pushes the trailing end 04 of the printing forme 37 into the chute 42. In the course of the insertion of the printing forme 37 into the chute 42, the suspension leg 14 at the trailing end 04 of this printing forme 37 first slides along the guide element 73 and is then placed on the first ramp 74, which is a part of the chute 42. The suspension leg 14 slides upward on the ramp 74 up to its high point 76 and thereafter reaches the support 72. While the contact pressure element 24 continues to be placed against the forme cylinder 33, the printing forme 37 is further pushed into the chute 42 by the rotation of the forme cylinder 33 opposite its production

direction P. In the course of this, the suspension leg 14 at the trailing end 04 also moves over the second ramp 77 connected with the conveying arrangement 81 and contacts the stop 79 which is connected with the second ramp 77 (Fig. 15).

The contact pressure element 24 is removed from the forme cylinder 33. Because of the push by the suspension leg 14 of the trailing end 04 against the stop 79, the suspension leg 13 at the leading end 03 of the printing forme 37, which is preferably positively connected and suspended at the front edge 16 of the opening 09, is released from the opening 09. Now the printing forme 37 freely rests with its leading end 03 on the shell 07 of the forme cylinder 33. From the release of the trailing leg 14 at the trailing end 04 until now, the forme cylinder 33 has performed less than half a revolution. The beveled suspension leg 14 at the trailing end 04 has been hooked between the second ramp 77 and the stop 79. Now the conveying device 81 connected with the second ramp 77 and the stop 79 can pull the printing forme 37 completely into the chute 42 (Fig. 16).

The printing forme 37 has been removed from the forme cylinder 33 and is located with its length L in the chute 42. Its suspension leg 14 at the trailing end 04 rests on the high point 76 of the second ramp 77, while it leading end 03 rests on the high point 76 of the first ramp 74, because of which at least the suspension leg 13 at the leading end 07 preferably hangs free. Therefore the seating of the printing forme 37 in the chute 42 is preferably provided by a support at two points, namely at the high points 76, 78 of the two ramps 74, 77 (Fig. 17).

The printing forme lifting device 82, which can preferably be operated pneumatically, for example, lifts the trailing end 04 of the printing forme 37 pulled into the chute 42 to shortly

underneath the securing element 86, wherein the suspension leg 14 stands on the lifting arm 84 connected with the printing forme lifting device 82 (Fig. 18).

While a first printing forme 37 to be mounted on the forme cylinder 33 rests with its beveled suspension legs 13, 14 on the support 54 in the upper chute 44, the forme cylinder 33 continues to rotate opposite its production direction P into a second position until the opening 09, from which the suspension leg 13 at the leading end 03 of the printing forme 37 previously removed from the forme cylinder 33 was released, has passed a contact point 88 of the contact pressure element 24 placed against the forme cylinder 33 and the rear edge 17 of the opening 09 which, in the production direction P of the forme cylinder, is at the rear, is at a distance a88 from the contact point 88, wherein the distance a88 lies in the range of a few millimeters, preferably less than 30 mm, and therefore corresponds to an arc length of less than a one-thirtieth part of the circumference of the forme cylinder 33. As a rule, the first position of the forme cylinder 33 for removing a printing forme 37 arranged on it is not identical to the second position for receiving a fresh printing forme 37. The contact force element 24 is preferably placed against the forme cylinder 33 while the opening 09 passes the contact point 88, or after it has passed the contact point 88. The alignment device 51 arranged close to the forme cylinder 33 pivots with its previously preferably horizontally arranged stops 52, 53, preferably by 90°, into a vertical position, so that a stop 52, 53, which is matched to the width B of the printing forme 37 to be mounted on the forme cylinder 33, dips into a transport plane, defined by the support 54 in the chute 44, for the printing forme 37 to be mounted on the forme cylinder 33, and the printing

forme 37 to be mounted on the forme cylinder 33 is aligned with the forme cylinder 33 at the stop 52, 53 with the correct side registration while being transported out of the chute 44 (Fig. 19).

The suspension leg 14 on the trailing end 04 of the first printing forme 37 to be mounted on the cylinder 33 rests against a stop 56, which is connected with a conveying device 57. The conveying device 57 is put into operation, so that the stop 56 conveys the first printing form 37 in a movement which is preferably directed tangentially to the forme cylinder 33, out of the chute 44 until its leading end 03 touches the contact force element 24 placed against the forme cylinder 33 and the beveled suspension leg 13 on this leading end 03 rests between the edge 17 of the opening 09, which is in the rear in the production direction P of the forme cylinder 33, and the contact point 88 of the contact force element 24 (Fig. 20).

The direction of rotation of the forme cylinder 33 is changed and it begins to rotate in its production direction P, so that the suspension leg 13 at the leading end 03 of the printing forme 37 placed on the forme cylinder 33 slides into the opening 09 and is suspended, preferably positively connected, at the front edge 16 of the opening 09 (Fig. 21).

By the continued rotation of the forme cylinder 33 in its production direction P, the printing forme 37, whose suspension leg 13 is suspended in the opening 09, is completely moved out of the chute 44 and is drawn on the forme cylinder 33. In the course of the draw-on process, the printing forme 37 is rolled onto the forme cylinder 33 by the contact force element 24 placed against the forme cylinder 33. After half a revolution of the forme cylinder 33 in its production direction P, the contact force

element 24 pushes the beveled suspension leg 14 at the trailing end 04 of the printing forme 37 into the opening 09. The holding means 21 in the groove 08 assigned to this opening 09 was released and is then brought into that operating position in which it fixes the suspension leg 14 at the trailing end 04 of the printing forme 37 introduced into the opening 09 in place, for example by clamping. The conveying device 57 moves the stop 56, which is connected with it, back into its end position on the side of the chute 44 facing away from the forme cylinder (Fig. 22).

The contact pressure element 24 is moved away from the forme cylinder 33, and the diametrical stops 52, 53 of the alignment device 51 are preferably again pivoted into a horizontal position. A change of a first printing forme 37 on the forme cylinder 33 is finished with the above described method steps in that a used printing forme 37 was removed and a fresh printing forme 37 was attached. This change of a printing forme 37 can be completely performed by means of the described device in a very short time, preferably less than one minute. Then the forme cylinder 33 is again ready for production (Fig. 23).

The change of a further second printing forme 37, for example arranged along the circumference of the forme cylinder 33, is started by an operator placing the fresh second printing forme 37 into the chute 44, preferably still during the previous running production. Then the second printing forme 37 is maintained above the support 54 in a controllable, preferably pneumatically controllable printing forme holder 58, in that the printing forme 37 is clamped, for example either at its ends 03, 04, between two stops 61, 62, for which purpose at least one of the stops 61, 62 is movable, or in that the printing forme 37 is inserted with its long sides into guide rails 64, wherein at least one of the guide

rails 64 can be moved along the width B of the printing forme 37. When the printing form holder 58 releases the printing forme 37 in that its elements holding the printing forme 37, for example the stops 61, 62, or the guide rails 64, increase their distance from each other, for example a58, at least briefly, the printing forme 37 falls onto the support 54 and rests thereon with its suspension legs 13, 14 (Fig. 24).

For removing a further, for example second, printing form 37 from the forme cylinder 33, corresponding to the method explained in connection with Fig. 13, the forme cylinder 33 rotates the opening 09 of the groove 08, in which the suspension leg 14 at the trailing end 04 of the second printing forme 37 which is to be removed from the forme cylinder 33, is held by a holding means 21, into the first position, which is located below the guide element 73, which is a part of the chute 42. The controllable, preferably pneumatically operable contact pressure element 24 is placed against the forme cylinder 33 (Fig. 25).

Corresponding to the method explained in connection with Fig. 14, the preferably pneumatically operable actuating means 23 pivots the holding means 21 against the force of a spring element 22, whereupon the suspension leg 14 at the trailing end 04 of the second printing forme 37 snaps out of the opening 09 because of its elastic inherent tension and contacts the guide element 73. The contact pressure element 24 placed against the forme cylinder secures the second printing forme 37 against further release from the shell 07 of the forme cylinder 33 (Fig. 26).

The forme cylinder 33 rotates opposite its production direction P and in the process pushes the trailing end 04 of the second printing forme 37 into the chute 42. In the course of the insertion of the printing forme 37 into the chute 42, the

suspension leg 14 at the trailing end 04 of this printing forme 37 first slides along the guide element 73 and is then placed on the first ramp 74, which is a part of the chute 42. The suspension leg 14 of the second printing forme 37 slides upward on the ramp 74, wherein it is pushed under the first printing forme 37 resting in the chute 42, which rests on the high point 76 of the first ramp 74, and lifts its leading end 03, which projects past the high point 76 and is oriented toward the forme cylinder 03, while the suspension leg 14 of the second printing forme 37 passes over the high point 76 of the first ramp 44 and thereafter reaches the support 72. While the contact pressure element 24 continues to be placed against the forme cylinder 33, the second printing forme 37 is further pushed into the chute 42 by the rotation of the forme cylinder 33 opposite its production direction P. In the course of this, the suspension leg 14 at the trailing end 04 of the first printing forme 37 resting in the chute 42 slides over the side with the printed image of the second printing forme 37 conveyed into the chute 42. In the further course of events, the suspension leg 14 at the second printing forme 37 also moves over the second ramp 77 connected with the conveying arrangement 81 and contacts the stop 79 which is connected with the second ramp 77 (Fig. 27).

The contact pressure element 24 is removed from the forme cylinder 33. Because of the push by the suspension leg 14 of the trailing end 04 against the stop 79, the suspension leg 13 at the leading end 03 of the second printing forme 37, which is preferably positively connected and suspended at the front edge 16 of the opening 09, is released from the opening 09. Now the leading end 03 of the suspension leg 13 freely rests on the shell 07 of the forme cylinder 33. From the release of the trailing leg

14 at the trailing end 04 until now, the forme cylinder 33 has again performed less than half a revolution. The beveled suspension leg 14 at the trailing end 04 has been hooked between the second ramp 77 and the stop 79. The lifting arm 84 of the printing forme lifting device 82 is lowered, so that the first printing forme 37 resting in the chute 44, the trailing end 04 of which up to now had been held by it, is placed on a strip 89 formed on the stop 79, wherein the strip 89 has a height h89 perpendicular to the support 72 whose value is greater than the length l14 of the beveled suspension leg 14 at the trailing end 04 of the second printing forme 37. The height h89 preferably has a value between the single and double length l14 of the beveled suspension leg 14 at the trailing end 04 of the second printing forme 37 (Fig. 28).

The conveying device 81 connected with the second ramp 77 and the stop 79 now pulls the second printing forme 37 completely into the chute 42, wherein the first and the second printing formes 37 are arranged on top of each other in the direction of their length L. The conveying device 81, together with the second ramp 77 and the stop 79 for the beveled suspension leg 14 at the trailing end 04 of the printing forme 37 introduced into the chute 42, constitute a moving device (Fig. 29).

Now, the printing forme lifting device 82 preferably lifts the trailing ends 04 of both printing formes 37 arranged in the chute 42 by means of its lifting arm 84 up to the securing element 86. The leading end 03 of the second printing forme 37 rests with a projection oriented toward the forme cylinder 33 on the high point 76 of the first ramp 74, and the beveled suspension leg 13 at the leading end 03 of the first printing form 37 rests on the leading end 03 of the second printing forme 37 (Fig. 30).

For mounting the second printing forme 37 lying ready in the upper chute 44, the forme cylinder 33 continues to rotate against the production direction P into the second position, until the opening 09, from which the suspension leg 13 at the leading end 03 of the second printing form 37 which had previously been removed from the forme cylinder 33 had been released, passes the contact point 88 of the contact pressure element 24 placed against the forme cylinder 33 and the rear edge 17 of the opening 09 which, in the production direction P of the forme cylinder, is at the rear, is at a distance a88 from the contact point 88, wherein the distance a88 lies in the range of a few millimeters, preferably less than 30 mm, and therefore corresponds to an arc length of less than a one-thirtieth part of the circumference of the forme cylinder 33 (Fig. 19). Preferably the contact pressure element 24 is placed against the forme cylinder 33 while the opening 09 passes the contact point 88, or after it has passed the contact point 88. The alignment device 51, arranged near the forme cylinder 33, preferably pivots its diametrical stops 52, 53, which preferably had been horizontally aligned previously, by 90° into a vertical position, so that a stop 52, 53, matched to the width B of the second printing forme 37 to be mounted on the forme cylinder 33, dips into transport plane, defined by the support 54 in the chute 44 for the second printing forme 37 to be mounted on the forme cylinder 33, and the second printing forme 37 to be mounted on the forme cylinder 33 is aligned with the forme cylinder 33 at the stop 52, 53 with the correct side registration while being transported out of the chute 44 (Fig. 31).

The suspension leg 14 on the trailing end 04 of the second printing forme 37 to be mounted on the cylinder 33 rests against a stop 56, which is connected with a conveying device 57.

Corresponding to the method explained in connection with Fig. 20, the conveying device 57 is put into operation, so that the stop 56 conveys the second printing form 37 in a movement which is preferably directed tangentially to the forme cylinder 33, out of the chute 44 until its leading end 03 touches the contact force element 24 placed against the forme cylinder 33 and the suspension leg 13 beveled at this leading end 03 rests between the edge 17 of the opening 09, which is in the rear in the production direction P of the forme cylinder 33, and the contact point 88 of the contact force element 24 (Fig. 32).

Corresponding to the method explained in connection with Fig. 21, the direction of rotation of the forme cylinder 33 is changed and it begins to rotate in its production direction P, so that the suspension leg 13 resting on the leading end 03 of the second printing forme 37 placed on the forme cylinder 33 slides into the opening 09 and is suspended, preferably positively connected, at the front edge 16 of the opening 09 (Fig. 33).

By the continued rotation of the forme cylinder 33 in its production direction P, the second printing forme 37, whose suspension leg 13 is suspended in the opening 09, is completely moved out of the chute 44 and is drawn on the forme cylinder 33. In the course of the draw-on process, the second printing forme 37 is rolled onto the forme cylinder 33 by the contact force element 24 placed against the forme cylinder 33. After half a revolution of the forme cylinder 33 in its production direction P, the contact force element 24 pushes the beveled suspension leg 14 at the trailing end 04 of the second printing forme 37 into the opening 09. The holding means 21 in the groove 08 assigned to this opening 09 was released and is then brought into that operating position in which it fixes the suspension leg 14 at the

trailing end 04 of the second printing forme 37 introduced into the opening 09 in place, for example by clamping. The conveying device 57 moves the stop 56, which is connected with it, back into its end position on the side of the chute 44 facing away from the forme cylinder. The upper chute 44 is now empty, while two used printing formes 37 have been placed into the lower chute 42 (Fig. 34).

The contact pressure element 24 is moved away from the forme cylinder 33, and the diametrical stops 52, 53 of the alignment device 51 are preferably again pivoted into a horizontal position. The change of a second printing forme 37 on the forme cylinder 33 is finished with the method steps so far described, in that a used second printing forme 37 was first removed and a fresh second printing forme 37 was attached. The forme cylinder 33 is again ready for production. This change can also be completely performed by means of the described device in less than one minute. The change of a first and a second printing forme 37 can therefore be terminated in less than two minutes, preferably altogether in less than ninety seconds (Fig. 35).

List of Reference Symbols

01	Dressing, printing forme
02	Support surface (01)
03	End, leading (01)
04	End, trailing (01)
05	-
06	Cylinder, forme cylinder
07	Shell (06)
08	Groove
09	Opening (08)
10	-
11	Bending edge (13)
12	Bending edge (14)
13	Suspension leg
14	Suspension leg
15	-
16	Edge, front, first (09)
17	Edge, rear, second (09)
18	Wall
19	Wall
20	-
21	Holding means
22	Spring element
23	Actuating means
24	Support element, contact pressure element, contact pressure roller, rolling element, cylinder, roll
25	-
26	Edge

27	Contact line
28	Fixation in position
29	Contact point
30	-
31	Cylinder, forme cylinder, first
32	Cylinder, rubber blanket cylinder, first
33	Cylinder, forme cylinder, second
34	Cylinder, rubber blanket cylinder, second
35	-
36	Dressing, printing forme
37	Dressing, printing forme
38	Printing forme magazine
39	Printing forme magazine
40	-
41	Chute
42	Chute
43	Chute
44	Chute
45	-
46	Material to be imprinted, paper web
47	Separating wall
48	Arresting device
49	Guide plate
50	-
51	Alignment device
52	Stop (51)
53	Stop (51)
54	Support (44), sliding rail, strip
55	-
56	Stop, pusher, register pin

57	Conveying device, conveying arrangement, belt drive, linear drive
58	Holder, printing forme holder
59	Piston, pusher
60	-
61	Elbow, stop, holding element
62	Stop, holding element
63	Inclined face (62)
64	Guide rail, holding element
65	-
66	Bracket (64)
67	Stop
68	Pivot arm, spring element, leaf spring
69	Drive mechanism, magnet
70	-
71	Code reader
72	Support, strips, sliding rails
73	Guide element, guide plate, wedge, rolling element, roller
74	Ramp, first
75	-
76	High point (74)
77	Ramp, second
78	High point (76)
79	Stop
80	-
81	Conveying device, conveying arrangement, belt drive, linear drive
82	Lifting device, printing forme lifting device
83	Piston

84	Lifting arm (82)
85	-
86	Securing element, flap
87	Lifting device, printing forme lifting device
88	Contact point
89	Strip (79)
90	-
91	Sensor
92	Paper guide roller, first
93	Paper guide roller, second
94	Inking system
95	-
96	Base
97	Frame

FR	Radial force
FG	Force of gravity
MR	Restoring moment

B	Width, dimension
D	Thickness of material
H	Horizontal line
L	Length, dimension
M	Mounting direction
P	Production direction
S	Slit width
T09	Tangent line
T29	Tangent line

a09	Distance
a37	Distance
a38	Distance
a39	Distance
a54	Distance
a58	Distance
a67	Distance
a73	Distance
a77	Distance
a86	Distance
a88	Distance
h89	Height
l13	Length
l14	Length
o38	Opening
o39	Opening
s68	Actuating path
s82	Lift

α1	Opening angle
α2	Opening angle
ß1	Opening angle
ß2	Opening angle
gamma	Angle
delta	Inclination angle